

# Accreditation Scope

**Quality Technical Services, NAL 095  
Calibration Laboratory, (ISO/IEC 17025:2017)**

**M72, MW4, Musaffah, Abu Dhabi, UAE**

Issue Date: 20-10-2021

Expiry Date: 28-08-2024

Issue No: 07

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Balances	Weighing Balance (Non-automatic weighing instrument)	(0.001 to 62) g	0.14 mg	QTS/M-WP-01:2021 Euramet cg-18:2015	P/S
		(>62 to 220) g	0.5 mg		
		(>220 to 1000) g	3 mg		
		(>1 to 10) kg	0.07 g		
		(>10 to 30) kg	0.3 g		
		(>30 to 100) kg	4 g		
		(>100 to 500) kg	17 g		
		(>500 to 1000) kg	0.17 kg		
Balances	Batching Plant	(10 to 10 000) kg	0.2 %	QTS/M-WP-03:2021 ASTM C94/C94M-16:2017	S
Mass	Conventional Mass	1 mg	0.06 mg	QTS/M-WP-02:2021 OIML R 111-1:2004  M1 from (1 to 500) mg F1 from (1 to 50) g F2 from (100 g to 5 kg) M1 from (10 to 20) kg	P
		2 mg	0.06 mg		
		5 mg	0.06 mg		
		10 mg	0.08 mg		
		20 mg	0.10 mg		
		50 mg	0.12 mg		
		100 mg	0.16 mg		
		200 mg	0.20 mg		
		500 mg	0.25 mg		
		1 g	0.03 mg		
		2 g	0.04 mg		
		5 g	0.05 mg		

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Mass	Conventional Mass	10 g	0.06 mg	QTS/M-WP-02:2021 OIML R 111-1:2004  M1 from (1 to 500) mg F1 from (1 to 50) g F2 from (100 g to 5 kg) M1 from (10 to 20) kg	P
		20 g	0.08 mg		
		50 g	0.10 mg		
		100 g	0.50 mg		
		200 g	1.0 mg		
		500 g	3.0 mg		
		1 kg	5.0 mg		
		2 kg	10 mg		
		5 kg	30 mg		
		10 kg	0.2 g		
		20 kg	0.3 g		
Force	Compression Machine (CBR Machine, Marshall testing machine, Flexural machine, UCS machine etc..)	(1 to 10) kN	0.11 %	QTS/F-WP-01:2021 ISO 7500-1:2018 ASTM E4:2020	S
		(5 to 50) kN	0.15 %		
		(10 to 100) kN	0.19 %		
		(30 to 300) kN	0.15 %		
	(200 to 3000) kN	0.57 %			
	Tension Machine (Tensile Testing machine, Pull off Tester, etc...)	(0.2 to 10) kN	0.26 %		
		(5 to 50) kN	0.08 %		
		(30 to 300) kN	0.16 %		
(120 to 1200) kN		0.18 %			

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Force	Compression Machine Stability Test	(200 to 2000) kN	0.37%	QTS/F-WP-02:2021 BS EN 12390-4:2019	S
	Proving Ring	(1 to 10) kN	0.11 %	QTS/F-WP-06:2021	P
		(>10 to 50) kN	0.15 %		
		(>50 to 200) kN	0.19 %		
Hydraulic Jacks	(1 to 300) kN	0.2 %	QTS/F-WP-04:2021	P	
	(300 to 1000) kN	0.6 %			
Dimensional	Caliper (Vernier, dial and digital)	(0 to 300) mm	20 µm	QTS/M-WP-01:2021 BS EN ISO 13385-1:2011	P
		(>300 to 1000) mm	40 µm		
		(> 1000 to 2000) mm	70 µm		
	External Micrometer (analog, digital and digimatic)	(0.001 to 25) mm	4 µm	QTS/M-WP-02:2021 BS EN ISO 3611:2010	P
		(>25 to 100) mm	5 µm		
		(>100 to 300) mm	11 µm		
		(>300 to 1000) mm	33 µm		
		(> 1000 to 2000) mm	65 µm		
	Internal Micrometer including Micrometer Stick (analog, digital and digimatic)	(0.001 to 25) mm	4 µm	QTS/M-WP-02:2021 BS 959:2008	P
		(>25 to 100) mm	5 µm		
		(>100 to 300) mm	11 µm		
	3-pt. Internal Micrometer	(0.001 to 100) mm	4 µm	QTS/D-WP-10:2021	P
		200 mm 300 mm	11 µm 11 µm		
	Feeler Gauge	(0.05 to 1) mm	3 µm	QTS/D-WP-11:2021 BS 957:2008	P

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Dimensional	Radius gauge, radius measurement (sheave gauge, etc...)	(1 to 300) mm	20 µm	QTS/D-WP-12:2021	P
	Protractors, angle gauges, angle measurement	0.1° to 360°	0.2 °	QTS/D-WP-13:2021	P
	Thickness Gauge (dial and digital)	(0.001 to 100) mm	0.02 mm	QTS/D-WP-08:2021	P
	Graduated Steel Rule	(0.001 to 1) m	0.4 mm	QTS/D-WP-15:2021 OIML R 35 2:2011	P
	Graduated Steel Tape	(0.001 to 100) m	0.04 %	QTS/D-WP-15:2021 OIML R 35 2:2011	P
	Dial Gauge (dial and digital)	(0.001 to 25) mm	4 µm	QTS/D-WP-03:2021 BS EN ISO 463:2006	P
		(>25 to 100) mm	6 µm		
		Displacement Transducer with indicator (LVDT)	(0.001 to 25) mm	4 µm	QTS/D-WP-14:2021
	(>25 to 100) mm		6 µm		
	(>100 to 600) mm		19 µm		
Test Sieves (Wire Mesh)	32 µm to 125 mm	9 µm	QTS/D-WP-18:2021 ASTM E11:2017 ISO 3310-1:2016 (BS 410-1)	P	
Test Sieves (Perforated Plate)	32 µm to 125 mm	9 µm	QTS/D-WP-18:2021 ASTM E 323:2017 ISO 3310-2:2016 (BS 410-2)	P	

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Pressure	Vacuum	(-0.9 to 0) bar	5 mbar	QTS/P-WP-01:2021 ISO 3567:2011	P / S
	Pressure- Pneumatic	(0 to 0.4) bar	2.3 mbar	QTS/P-WP-01:2021 DKD-R 6-1:2014	P / S
		(>0.4 to 20) bar	5 mbar		
		(>20 to 160) bar	23 mbar		
	Pressure- Hydraulic	(0 to 700) bar	0.19 bar		
		(>700 to 2500) bar	2.3 bar		
Temperature	Direct Indicating Thermometer with TC Sensor	(-40 to 0) °C	0.22 °C		
		(0 to 120) °C	0.28 °C		
		(>120 to 600) °C	1.4 °C		
		(>600 to 1200) °C	3.7 °C		
	Direct Indicating Thermometer with RTD Sensor	(-40 to 0) °C	0.21 °C	QTS/T-WP-01:2021 ASTM E2877-12e1:2012	P
		(0 to 120) °C	0.21 °C		
		(>120 to 600) °C	0.84 °C		
	Infrared Thermometer – surface mode	(-30 to 10) °C	2.5 °C	QTS/T-WP-02:2021 ASTM E2847:2014	P
		(>10 to 150) °C	1.9 °C		
		(>150 to 500) °C	2.5 °C		
	Liquid-in-glass Thermometer	(-40 to 50) °C	0.25 °C	QTS/T-WP-03:2021 OIML R 133:2002	P
		(>50 to 250) °C	0.27 °C		

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Temperature	Climatic Chamber (Calibration of Chillers, Incubators, Freezers, Ovens, 1 pt / 9 pt )	(-30 to 100) °C	0.7 °C	QTS/T-WP-04:2021 DKD-R 5-7:2009 Methods (A, B & C)	P / S
		(>100 to 300) °C	1.3 °C		
	Climatic Chamber Temperature (1 pt calibration of Furnace, asphalt content, etc)	Ambient temperature up to 250 °C	0.7 °C	QTS/T-WP-04:2021	P / S
		> (250 to 1200) °C	2.9 °C		
	Liquid Bath (5 pt calibration)	(-30 to 300) °C	0.7 °C	QTS/T-WP-04:2021 DKD-R 5-7(C):2009	P / S
Humidity	Humidity Chamber	15% RH to 80% RH	2.7 % RH	QTS/T-WP-04:2021 DKD-R 5-7(C):2009	P / S
Temperature and Humidity	Thermo- hygrometer	(5 to 50) °C	0.4 °C	QTS/T-WP-06:2021	P
		(15 % to 80 %) RH	2.7 % RH		
Temperature and Pressure	Autoclave	(25 to 140) °C	0.4 °C	QTS/T-WP-07:2021	P / S
		(0 to 4) bar	0.03 bar		

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Rotation Speed	Tachometer, contact rotation measuring instrument	(0.1 to 100) rpm	1.2 rpm	QTS/Ph-WP-01:2021	P / S
		(>100 to 1 000) rpm	1.4 rpm		
		(>1 000 to 10 000) rpm	6.1 rpm		
	Tachometer, non-contact rotation measuring instrument	(0.1 to 1 000) rpm	3 rpm		
		(>1000 to 30 000) rpm	6 rpm		
		(>30 000 to 50 000) rpm	9 rpm		
	Contact Rotation Source Instrument	(>50 000 to 90000) rpm	16 rpm		
		(0.1 to 100) rpm	0.7 rpm		
		(>100 to 1 000) rpm	0.9 rpm		
	Non-Contact Rotation Source Instrument	(>1 000 to 10 000) rpm	6 rpm		
		(0.1 to 1 000) rpm	2 rpm		
		(>1000 to 30 000) rpm	4 rpm		
(>30 000 to 50 000) rpm		7 rpm			
		(>50 000 to 90000) rpm	11 rpm		
Wind Velocity	Air meter, Anemometer, Air Flow	(0.1 to 30) m/s	8 %	QTS/En-WP-03:2021	P
pH	pH Meter	(4, 7, 10) pH @ 25 °C	0.02 pH	QTS/En-WP-02:2021	P / S
Electrical Conductivity	Electrical conductivity (EC) meter	(100, 1413, 10,000) µS/cm @ 25 °C	2.6 %	QTS/Ph-WP-02:2021	P / S
Dissolved Solids in water	Water Dissolved Solids meter (DS)	(66.3, 941, 6656) ppm @ 25 °C	2.6 %	QTS/Ph-WP-02:2021	P / S

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Viscosity	Kinematic viscosity (Viscometer, BS-ISO-Ford Viscosity cup)	(400 to 35 000) cSt @ 25 °C	3.3 %	QTS/Ph-WP-02:2021	P / S
	Dynamic viscosity (Viscometer, BS-ISO-Ford Viscosity cup)	(500 to 31500) mPa.s @ 25 °C	3.2 %	QTS/Ph-WP-02:2021	P / S
Electrical - Source	DC Voltage	(0.001 to < 330) mV	23 µV/V	QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(0.330 to < 3.3) V	13 µV/V		
		(3.3 to < 33) V	13 µV/V		
		(33 to < 330) V	18 µV/V		
		(330 to 1020) V	21 µV/V		
	DC Current	(0.1 to < 330) µA	0.020 %	QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(0.330 to < 3.3) mA	0.012 %		
		(3.3 to < 33) mA	0.012 %		
		(33 to < 330) mA	0.009 %		
		(0.33to < 1.1) A	0.023 %		
		(1.1 to < 3) A	0.012 %		
		(3 to < 11) A	0.051 %		
	DC Current - Clamp meter	(11 to 20) A	0.097 %	QTS/E-WP-02:2021	P
(0.1 to <16.5) A		1.4 %			
(16.5 to < 150) A		0.49 %			
		(150 to 1025) A	0.44 %		



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Electrical - Source	Resistance	(0.001 to < 11) Ω	170 μΩ/Ω	QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(11 to < 33) Ω	110 μΩ/Ω		
		(33 to < 110) Ω	40 μΩ/Ω		
		(110 to < 330) Ω	37 μΩ/Ω		
		(0.33 to < 1.1) kΩ	28 μΩ/Ω		
		(1.1 to < 3.3) kΩ	28 μΩ/Ω		
		(3.3 to < 11) kΩ	25 μΩ/Ω		
		(11 to < 33) kΩ	26 μΩ/Ω		
		(33 to < 110) kΩ	30 μΩ/Ω		
		(110 to < 330) kΩ	28 μΩ/Ω		
		(0.33 to < 1.1) MΩ	31 μΩ/Ω		
		(1.1 to < 3.3) MΩ	57 μΩ/Ω		
		(3.3 to < 11) MΩ	0.012%		
		(11 to < 33) MΩ	0.027%		
		(33 to < 110) MΩ	0.067%		
	(110 to < 330) MΩ	0.27%			
	(0.33 to 1.1) GΩ	1.3%			
	Resistance (4 wire)	(0.1 to < 1) Ω	9.2 mΩ	QTS/E-WP-06:2021	P
		(1 to < 5) Ω	0.026 Ω		
		(5 to < 30) Ω	0.43%		
(30 to < 200) Ω		0.43%			
(200 to < 500) Ω		0.43%			
(0.5 to < 2) kΩ		0.43%			
(2 to < 5) kΩ		0.43%			
(5 to 10) kΩ	0.43%				

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Electrical - Source	Insulation Resistance	(10 to < 40) kΩ	0.14%	QTS/E-WP-09:2021	P
		(40 to < 100) kΩ	0.14%		
		(100 to < 200) kΩ	0.14%		
		(0.2 to < 1) MΩ	0.60%		
		(1 to < 10) MΩ	0.24%		
		(10 to < 1) GΩ	0.36%		
		(1 to < 10) GΩ	0.83%		
		(10 to 98) GΩ	2.06%		
	AC Voltage	(3 to < 33) mV		QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(10 to 45) Hz	0.079%		
		45 Hz to 10 kHz	0.036%		
		(10 to 20) kHz	0.039%		
		(20 to 50) kHz	0.093%		
		(50 to 100) kHz	0.30%		
		(100 to 500) kHz	0.78%		
		(33 to < 330) mV			
		(10 to 45) Hz	0.025%		
		45 Hz to 10 kHz	0.015%		
		(10 to 20) kHz	0.016%		
		(20 to 50) kHz	0.029%		
		(50 to 100) kHz	0.069%		
		(100 to 500) kHz	0.17%		
		(0.33 to < 3.3) V			
		(10 to 45) Hz	0.025%		
		45 Hz to 10 kHz	0.014%		
		(10 to 20) kHz	0.017%		
		(20 to 50) kHz	0.027%		
		(50 to 100) kHz	0.068%		
(100 to 500) kHz	0.22%				

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Electrical - Source	AC Voltage	(3.3 to < 33) V		QTS/E-WP-01:2021 EURAMET cg-15:2015	P			
		(10 to 45) Hz	0.014%					
		45 Hz to 10 kHz	0.016%					
		(10 to 20) kHz	0.022%					
		(20 to 50) kHz	0.029%					
		(50 to 100) kHz	0.074%					
		(33 to < 330) V						
		(45 Hz to 1 kHz)	0.015%					
		(1 to 10) kHz	0.017%					
		(10 to 20) kHz	0.021%					
		(20 to 50) kHz	0.027%					
		(50 to 100) kHz	0.17%					
		(330 to 1020) V						
		(45 Hz to 1 kHz)	0.026%					
		(1 to 5) kHz	0.021%					
		(5 to 10) kHz	0.028%					
		AC Current	(33 to < 330) $\mu$ A				QTS/E-WP-01:2021 EURAMET cg-15:2015	P
			(10 to 20) Hz			0.18%		
	(20 to 45) Hz		0.14%					
	45 Hz to 1 kHz		0.13%					
	(1 to 5) kHz		0.28%					
	(5 to 10) kHz		0.65%					
	(10 to 30) kHz	1.4%						
	(0.33 to < 3.3) mA							
(10 to 20) Hz	0.16%							
(20 to 45) Hz	0.10%							
45 Hz to 1 kHz	0.08%							
(1 to 5) kHz	0.16%							
(5 to 10) kHz	0.39%							
(10 to 30) kHz	0.84%							

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Electrical - Source	AC Current	(3.3 to < 33) mA		QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(10 to 20) Hz	0.14%		
		(20 to 45) Hz	0.08%		
		45 Hz to 1 kHz	0.04%		
		(1 to 5) kHz	0.07%		
		(5 to 10) kHz	0.16%		
		(10 to 30) kHz	0.33%		
		(33 to < 330) mA			
		(10 to 20) Hz	0.14%		
		(20 to 45) Hz	0.08%		
		45 Hz to 1 kHz	0.04%		
		(1 to 5) kHz	0.10%		
		(5 to 10) kHz	0.19%		
		(10 to 30) kHz	0.37%		
		(0.33 to < 1.1) A			
		(10 to 45) Hz	0.16%		
		45 Hz to 1 kHz	0.06%		
		(1 to 5) kHz	0.53%		
		(5 to 10) kHz	2.4%		
		(1.1 to < 3) A			
		(10 to 45) Hz	0.14%		
		45 Hz to 1 kHz	0.05%		
		(1 to 5) kHz	0.45%		
		(5 to 10) kHz	1.9%		
		(3 to < 11) A			
		(45 to 100) Hz	0.11%		
		(0.1 to 1) kHz	0.14%		
		(1 to 5) kHz	2.6%		

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Electrical - Source	AC Current	(11 to 20.5) A		QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(45 to 100) Hz	0.15%		
		(0.1 to 1) kHz	0.18%		
		(1 to 5) kHz	2.5%		
	AC Current – Clamp meter	(45 to 65) Hz		QTS/E-WP-02:2021	P
		(0.1 to < 16.5) A	1.5%		
		(16.5 to < 150) A	0.57%		
		(150 to 1025) A	0.50%		
	Capacitance	(0.22 to < 0.4) nF	2.47%	QTS/E-WP-01:2021 EURAMET cg-15:2015	P
		(0.4 to < 1.1) nF	1.6%		
		(1.1 to < 3.3) nF	0.82%		
		(3.3 to < 11) nF	0.37%		
		(11 to < 33) nF	0.48%		
		(33 to < 110) nF	0.31%		
		(110 to < 330) nF	0.29%		
		(0.33 to < 1.1) μF	0.27%		
		(1.1 to < 3.3) μF	0.30%		
		(3.3 to < 11) μF	0.27%		
		(11 to < 33) μF	0.48%		
		(33 to < 110) μF	0.44%		
		(110 to < 330) μF	0.46%		
		(0.33 to < 1.1) mF	0.47%		
		(1.1 to < 3.3) mF	0.48%		
	(3.3 to < 11) mF	0.48%			
	(11 to < 33) mF	0.70%			
	(33 to 110) mF	0.96%			
	Frequency	(120 to < 1200) Hz	7 μHz/Hz	QTS/E-WP-01:2021 EURAMET cg-15:2015	P
(1.2 to < 12) kHz		7 μHz/Hz			
(12 to < 100) kHz		7 μHz/Hz			

# Accreditation Scope

**Quality Technical Services, NAL 095**  
**Calibration Laboratory, (ISO/IEC 17025:2017)**

**M72, MW4, Musaffah, Abu Dhabi, UAE**

Issue Date: 20-10-2021

Expiry Date: 28-08-2024

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical - Source	DC Power (single phase)	(3 to 1020) V (0.1 to 20) A		QTS/E-WP-01:2021	P
		0.3 W to 3.06 kW	0.14 %		
		(> 3.06 to 20.4) kW	0.14 %		
	AC Power (single phase)	(3 to 1020) V (0.1 to 20) A 45 Hz to 50 kHz		QTS/E-WP-01:2021	P
		0.3 W to 3.06 kW	0.18 %		
		(> 3.06 to 20.4) kW	0.19 %		
	Phase	10 Hz to 30 kHz		QTS/E-WP-01:2021	P
		0.01° to 90°	0.4 %		
	Ground Bond Resistance 4-wire	1.05 mΩ @3 A max	14 %	QTS/E-WP-07:2021	P
		16.43 mΩ @3 A max	4.0 %		
		42.28 mΩ @2.8 A max	3.9%		
		85.4 mΩ @ 2.5A max	2.1%		
		340.6 mΩ @1.4 A max	1.1%		
		479.3 mΩ @1.2 A max	0.8%		
		867.4 mΩ @ 0.8 A max	0.9%		
		1.693 Ω @ 0.6 A max	0.5%		
		4.647 Ω @ 0.32 A max	0.4%		
		8.703 Ω @ 0.2 A max	0.4%		
		16.93 Ω @ 0.15 A max	0.3%		
46.89 Ω @ 80 mA max		0.5%			
90.93 Ω @ 50 mA max		0.4%			
172.85 Ω @ 25 mA max		0.4%			
471.5 Ω @ 10 mA max	0.4%				
881.3 Ω @ 5 mA max	0.4%				
1.7 kΩ @ 3 mA max	0.5%				

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical - Source	Line/Loop Impedance 50.0 Hz, 2-wire	30.32 mΩ	27%	QTS/E-WP-08:2021	P
		55.59 mΩ	15%		
		94.5 mΩ	8.7%		
		355.9 mΩ	2.8%		
		495.7 mΩ	2.2%		
		884.7 mΩ	1.6%		
		1.710 Ω	1.1%		
		4.665 Ω	0.6%		
		8.716 Ω	0.5%		
		16.944 Ω	0.5%		
		46.90 Ω	0.5%		
		90.94 Ω	0.4%		
		172.79 Ω	0.4%		
		471.5 Ω	0.4%		
		881.5 Ω	0.4%		
1.7 kΩ	0.5%				
Leakage Current	(0.1 to 28) mA	0.85 %	QTS/E-WP-07:2021	P	
Residual Current Device (RCD) - Trip Current	10 mA to 2.5 A	0.7 %	QTS/E-WP-07:2021	P	
Residual Current Device (RCD) - Trip Time	50 ms to 4.1 s	0.5 %	QTS/E-WP-07:2021	P	
Oscilloscope	Rise Time (period)	2 ns to 5 s	68 μs/s	QTS/E-WP-04:2021 EURAMET cg-07:2011	P
	Amplitude (Vertical Axis)	1 mV to 130 V	0.6 %		
	Bandwidth	(1 to 600) MHz	4 %		

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical - Measure	DC Voltage	(0.001 to 100) mV	14 $\mu$ V/V	QTS/E-WP-03:2021	P
		(> 0.1 to 1) V	43 $\mu$ V/V		
		(> 1 to 10) V	43 $\mu$ V/V		
		(> 10 to 100) V	59 $\mu$ V/V		
		(> 100 to 1000) V	64 $\mu$ V/V		
		(> 1 to 5) kV	0.39%		
		(>5 to 10) kV	0.26%		
	DC current meters Welding machine and similar	(0.001 to 10) $\mu$ A	63 $\mu$ A/A	QTS/E-WP-03:2021	P
		(> 10 to 100) $\mu$ A	18 $\mu$ A/A		
		(> 0.1 to 1) mA	17 $\mu$ A/A		
		(> 1 to 10) mA	17 $\mu$ A/A		
		(> 10 to 100) mA	68 $\mu$ A/A		
		(> 0.1 to 1) A	0.022%		
		(> 1 to 10) A	0.027%		
		(> 10 to 30) A	0.065%		
	Resistance	(> 30 to 890) A	2.8 %	QTS/E-WP-08:2021	P/S
		(0.0001 to 1) $\Omega$	75 $\mu\Omega/\Omega$	QTS/E-WP-02:2021	P
		(> 1 to 10) $\Omega$	23 $\mu\Omega/\Omega$		
		(> 10 to 100) $\Omega$	14 $\mu\Omega/\Omega$		
		(> 0.1 to 1) k $\Omega$	15 $\mu\Omega/\Omega$		
		(> 1 to 10) k $\Omega$	15 $\mu\Omega/\Omega$		
		(> 10 to 100) k $\Omega$	16 $\mu\Omega/\Omega$		
		(> 0.1 to 1) M $\Omega$	15 $\mu\Omega/\Omega$		
		(> 1 to 10) M $\Omega$	28 $\mu\Omega/\Omega$		
		(> 10 to 100) M $\Omega$	0.019%		
		(> 0.1 to 1) G $\Omega$	0.20%		
	(> 1 to 10) G $\Omega$	0.21%			



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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical - Measure	AC Voltage	(0.001 to 10) mV		QTS/E-WP-03:2021	P
		10 Hz to 2 kHz	0.035 %		
		(2 to 10) kHz	0.042 %		
		(10 to 30) kHz	0.047 %		
		(30 to 100) kHz	0.26 %		
		(100 to 300) kHz	0.90 %		
		(0.3 to 1) MHz	1.6 %		
		(> 10 to 100) mV			
		10 Hz to 2 kHz	0.013 %		
		(2 to 10) kHz	0.017 %		
		(10 to 30) kHz	0.029 %		
		(30 to 100) kHz	0.066 %		
		(100 to 300) kHz	0.26 %		
		(0.3 to 1) MHz	0.94 %		
		(> 0.1 to 1) V			
		10 Hz to 2 kHz	0.011 %		
		(2 to 10) kHz	0.015 %		
		(10 to 30) kHz	0.029 %		
		(30 to 100) kHz	0.065 %		
		(100 to 300) kHz	0.27 %		
		(0.3 to 1) MHz	0.94 %		
		(> 1 to 10) V			
		10 Hz to 2 kHz	0.011 %		
		(2 to 10) kHz	0.015 %		
		(10 to 30) kHz	0.027 %		
		(30 to 100) kHz	0.065 %		
		(100 to 300) kHz	0.27 %		
(0.3 to 1) MHz	0.94 %				

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Electrical - Measure	AC Voltage	(> 10 to 100) V		QTS/E-WP-03:2021	P
		10 Hz to 2 kHz	0.011 %		
		(2 to 10) kHz	0.014 %		
		(10 to 30) kHz	0.027 %		
		(30 to 100) kHz	0.069 %		
		(100 to 300) kHz	0.44 %		
		(0.3 to 1) MHz	1.2 %		
		(> 0.1 to 1) kV			
		(10 Hz to 2 kHz)	0.013 %		
		(2 to 10) kHz	0.013 %		
		(10 to 30) kHz	0.028 %		
		(30 to 100) kHz	0.073 %		
		(>1 to 5) kV			
		(50 to 60) Hz	0.74%		
	(>5 to 7) kV				
	(50 to 60) Hz	0.52%			
	AC current meters Welding machine and similar	(> 10 to 100) $\mu$ A		QTS/E-WP-03:2021	P
		(10 Hz to 2 kHz)	0.04 %		
		(2 to 10) kHz	0.06 %		
		(10 to 30) kHz	0.08 %		
		(30 to 100) kHz	0.39 %		
		(> 0.1 to 1) mA			
		(10 Hz to 2 kHz)	0.03 %		
		(2 to 10) kHz	0.06 %		
(10 to 30) kHz		0.07 %			
(30 to 100) kHz		0.39 %			
(>1 to 10) mA					
(10 Hz to 2 kHz)	0.03 %				
(2 to 10) kHz	0.06 %				
(10 to 30) kHz	0.07 %				

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)	
Electrical - Measure	AC current meters Welding machine and similar	(30 to 100) kHz	0.39 %	QTS/E-WP-03:2021	P	
		(> 10 to 100) mA				
		(10 Hz to 2 kHz)	0.03 %			
		(2 to 10) kHz	0.06 %			
		(10 to 30) kHz	0.07 %			
		(0.1 to 1) A				
		(10 Hz to 2 kHz)	0.04 %			
		(2 to 10) kHz	0.06 %			
		(10 to 30) kHz	0.08 %			
		(> 1 to 10) A				
		(10 Hz to 2 kHz)	0.11 %			
		(2 to 10) kHz	0.1 %			
		(> 10 to 30) A				
		(10 Hz to 2 kHz)	0.12 %			
	(2 to 10) kHz	0.11 %				
			(40 to 400) Hz	2.0 %	QTS/E-WP-08:2021	P/S
		Capacitance	(0.001 to 1) nF	0.28 %	QTS/E-WP-03:2021	P
			(> 1 to 10) nF	0.23 %		
			(> 10 to 100) nF	0.06 %		
	(> 0.1 to 1) μF		0.06 %			
	(> 1 to 10) μF		0.05 %			
	(> 10 to 100) μF		0.07 %			
	(> 0.1 to 1) mF		0.07 %			
	(> 1 to 10) mF		0.08 %			
		(> 10 to 100) mF	0.09 %			
	Frequency	(10 Hz to 100) MHz	10 μHz/Hz	QTS/E-WP-03:2021	P	

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Temperature Simulation – Source and Measure	Thermocouple Type B	(600 to 800) °C	0.89 °C	QTS/E-WP-05:2021	P/S
		(> 800 to 1000) °C	0.73 °C		
		(> 1000 to 1550) °C	0.59 °C		
		(> 1550 to 1820) °C	0.60 °C		
	Thermocouple Type E	(-250 to -100) °C	0.72 °C	QTS/E-WP-05:2021	P/S
		(> -100 to -25) °C	0.19 °C		
		(> -25 to 350) °C	0.14 °C		
		(> 350 to 650) °C	0.15 °C		
	Thermocouple Type J	(> 650 to 1000) °C	0.17 °C	QTS/E-WP-05:2021	P/S
		(-210 to -100) °C	0.38 °C		
		(> -100 to -30) °C	0.19 °C		
		(> -30 to 150) °C	0.16 °C		
	Thermocouple Type K	(> 150 to 760) °C	0.16 °C	QTS/E-WP-05:2021	P/S
		(> 150 to 760) °C	0.20 °C		
		(-200 to -100) °C	0.47 °C		
		(> -100 to -25) °C	0.25 °C		
	Thermocouple Type N	(> -25 to 120) °C	0.20 °C	QTS/E-WP-05:2021	P/S
		(> 120 to 1000) °C	0.25 °C		
		(> 1000 to 1372) °C	0.33 °C		
		(-200 to -100) °C	0.68 °C		
Thermocouple Type R	(> -100 to -25) °C	0.34 °C	QTS/E-WP-05:2021	P/S	
	(> -25 °C to 120) °C	0.25 °C			
	(> 120 to 410) °C	0.21 °C			
	(> 410 to 1300) °C	0.25 °C			
Thermocouple Type R	(0 to 250) °C	0.77 °C	QTS/E-WP-05:2021	P/S	
	(> 250 to 400) °C	0.65 °C			
	(> 400 to 1000) °C	0.52 °C			
		(> 1000 to 1767) °C	0.58 °C		

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Temperature Simulation – Source and Measure	Thermocouple Type S	(0 to 250) °C	0.78 °C	QTS/E-WP-05:2021	P/S
		(> 250 to 1000) °C	0.70 °C		
		(> 1000 to 1400) °C	0.60 °C		
		(> 1400 to 1767) °C	0.68 °C		
	Thermocouple Type T	(-250 to -150) °C	1.1 °C	QTS/E-WP-05:2021	P/S
		(> -150 to 0) °C	0.33 °C		
		(> 0 to 120) °C	0.18 °C		
		(> 120 to 400) °C	0.15 °C		
	RTD - Pt 385, 100 Ω	(-200 to -80) °C	0.09 °C	QTS/E-WP-05:2021	P/S
		(> -80 to 0) °C	0.09 °C		
		(> 0 to 100) °C	0.09 °C		
		(> 100 to 300) °C	0.10 °C		
		(> 300 to 400) °C	0.11 °C		
		(> 400 to 630) °C	0.11 °C		
	RTD - Pt 3926, 100 Ω	(-200 to -80) °C	0.09 °C	QTS/E-WP-05:2021	P/S
		(> -80 to 0) °C	0.09 °C		
		(> 0 to 100) °C	0.09 °C		
		(> 100 to 300) °C	0.10 °C		
		(> 300 to 400) °C	0.10 °C		
		(> 400 to 630) °C	0.11 °C		
	RTD - Pt 3916, 100 Ω	(-200 to -190) °C	0.19 °C	QTS/E-WP-05:2021	P/S
		(> -190 to -80) °C	0.08 °C		
		(> -80 to 0) °C	0.09 °C		
		(> 0 to 100) °C	0.09 °C		
		(> 100 to 260) °C	0.09 °C		
		(> 260 to 300) °C	0.10 °C		
		(> 300 to 400) °C	0.10 °C		
		(> 400 to 630) °C	0.18 °C		

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Temperature Simulation – Source and Measure	RTD - Pt 385, 200 Ω	(-200 to -80) °C	0.05 °C	QTS/E-WP-05:2021	P/S
		(> -80 to 0) °C	0.05 °C		
		(> 0 to 100) °C	0.05 °C		
		(> 100 to 260) °C	0.06 °C		
		(> 260 to 300) °C	0.10 °C		
		(> 300 to 400) °C	0.10 °C		
		(> 400 to 600) °C	0.11 °C		
	RTD - Pt 385, 500 Ω	(> 600 to 630) °C	0.12 °C	QTS/E-WP-05:2021	P/S
		(-200 to -80) °C	0.04 °C		
		(> -80 to 0) °C	0.04 °C		
		(> 0 to 100) °C	0.04 °C		
		(> 100 to 260) °C	0.05 °C		
		(> 260 to 300) °C	0.06 °C		
		(> 300 to 400) °C	0.06 °C		
	RTD - Pt 385, 1 kΩ	(> 400 to 600) °C	0.07 °C	QTS/E-WP-05:2021	P/S
		(> 600 to 630) °C	0.08 °C		
		(-200 to -80) °C	0.03 °C		
		(> -80 to 0) °C	0.03 °C		
		(> 0 to 100) °C	0.04 °C		
		(> 100 to 260) °C	0.04 °C		
		(> 260 to 300) °C	0.05 °C		
Temperature	Dry Block Calibrator	(-40 to 600) °C	0.3 °C	QTS/T-WP-05:2021	P
		(> 600 to 1200) °C	2.9 °C		
	Infrared Thermometer – body mode	(20 to 50) °C	0.3 °C	QTS/T-WP-02:2021	P

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Volume	Pipette Micropipette	(> 100 to 1000) µl	9 µl	QTS/Ph-WP-04:2021	P
		(> 1 to 10) ml	0.013 ml		
	Burette	10 ml	0.07 ml	QTS/Ph-WP-04:2021	P
		25 ml	0.07 ml		
		50 ml	0.07 ml		
		100 ml	0.08 ml		
	Beakers Measuring Cylinder	10 ml	0.08 ml	QTS/Ph-WP-04:2021	P
		20 ml	0.15 ml		
		50 ml	0.23 ml		
		100 ml	0.44 ml		
		200 ml	0.63 ml		
		500 ml	0.83 ml		
	Single-mark Flask	1 L	1.6 ml	QTS/Ph-WP-04:2021	P
		2 L	2.3 ml		
		10 ml	0.05 ml		
		20 ml	0.06 ml		
		50 ml	0.08 ml		
100 ml		0.09 ml			
200 ml		0.13 ml			
500 ml	0.17 ml				
Acoustic	Acoustic Calibrator	74 dB	0.8 dB	QTS/En-WP-01:2021	P / S
		84 dB	0.8 dB		
		94 dB	0.8 dB		
		104 dB	0.8 dB		
		114 dB	1.0 dB		

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Acoustic	Sound Level Meter	74 dB, 84 dB, 94 dB, 104 dB, 114 dB	0.2 dB	QTS/En-WP-01:2021	P / S
Illuminance	Light Meter	(0.1 to 20) klux	4.4 %	QTS/En-WP-07:2021	P
Material Gloss	Gloss Meter	(10 to 100) gloss unit (Gu)	5 Gu	QTS/Ph-WP-05:2021	P / S
Time Interval	Stopwatch Timer	1 min to 1 hour	0.2 sec	QTS/Ph-WP-02:2021	P
Torque	Torque Tools (preset, indicating, torque screw)	(2.8 to 28) N.m	0.6 %	QTS/F-WP-05:2021 ISO 6789-1:2017 & ISO 6789-2:2017	P
		(> 20.3 to 200) N.m	0.9 %		
		(> 0.2 to 2) kN.m	0.9 %		
Material Hardness	Hardness Testing Machine and Material Hardness - Indirect Verification (Rockwell, Brinell, Vickers)	Rockwell 25 HRC	0.5 HRC	QTS/Ph-WP-03:2021	P / S
		Rockwell 45 HRC	0.5 HRC		
		Rockwell 63 HRC	0.5 HRC		
		Rockwell 35 HRB	0.9 HRC		
		Rockwell 55 HRB	0.9 HRC		
		Rockwell 75 HRB	0.9 HRC		
	Durometer – Shore A	(0 to 100) HA	0.6 HA		
	Durometer – Shore D	(0 to 100) HD	0.6 HD		



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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Dimensional	Surface Plate Flatness	(0.3 × 0.3) m to (2 × 2) m	16 μm	QTS/D-WP-29:2021	P / S
	Dial Gauge calibrator	(0.001 to 50) mm	3 μm	QTS/D-WP-17:2021	P
	2 Dimensional Profile Projector (Linear axis, angle, circle)	x = (0.1 to 400) mm y = (0.1 to 400) mm	(6 + 10 L) μm; L in meter	QTS/D-WP-09:2021	P / S
		Angle : 0.1° to 360°	0.2°		
	Dial Test Indicator (Lever Type)	(0.01 to 1.6) mm	4 μm	QTS/D-WP-04:2021	P
	Height Gauge	(0.5 to 300) mm	20 μm	QTS/D-WP-05:2021	P
		(> 300 to 1000) mm	40 μm		
		(> 1 to 2) m	70 μm		
	Depth Gauge and Depth Caliper	(0.5 to 300) mm	20 μm	QTS/ D -WP-06:2021	P
		(> 300 to 1000) mm	50 μm		
		(> 1 to 2) m	80 μm		
	Depth Micrometer	(0.5 to 300) mm	20 μm	QTS/ D -WP-33:2021	P
		(> 300 to 1000) mm	50 μm		
		(> 1 to 2) m	80 μm		
	Bore Gauge (Two points)	(6 to 300) mm	10 μm	QTS/D-WP-07:2021	P
(> 300 to 600) mm		30 μm			
Pin Gauges	(0.17 to 25) mm	6 μm	QTS/D-WP-19:2021	P	
Thread Plug gauges (Major, Effective Diameter)	( 2 to 100 ) mm	6 μm	QTS/D-WP-20:2021	P	

# Accreditation Scope

**Quality Technical Services, NAL 095**  
**Calibration Laboratory, (ISO/IEC 17025:2017)**

**M72, MW4, Musaffah, Abu Dhabi, UAE**

**Issue Date: 20-10-2021**

**Expiry Date: 28-08-2024**

**Issue No: 07**

Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Dimensional	Thread Ring Gauge (Minor, Effective Diameter)	(6 to 100) mm	6 µm	QTS/D-WP-21:2021	P
	Plain Plug gauge (diameter, roundness, straightness and parallelism)	(2 to 100) mm	6 µm	QTS/D-WP-22:2021 EURAMET cg-06:2011	P
	Plain Ring gauge (diameter, roundness, straightness and parallelism)	(6 to 300) mm	6 µm	QTS/D-WP-25:2021 EURAMET cg-06:2011	P
	Micrometer Setting Rod	(25 to 600) mm	(3 to 12) µm	QTS/D-WP-24:2021	P
	Circumference Tape	(10 to 300) mm diameter	0.7 mm	QTS/D-WP-30:2021	P
	Contact Extensometer	(0.5 to 50) mm	0.6 mm	QTS/D-WP-26:2021	P/S
	Surface Roughness	(0.4 to 250) µm	0.6 µm	QTS/Ph-WP-07:2021	P/S
	Dial Gauge for Penetrometer, or similar	(0.001 to 300) mm	30 µm	QTS/D-WP-27:2021	P

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Calibration Field/ Quantity/ Property	Measurand / Equipment	Measuring Range	CMC (k=2)	Calibration Method (Standard/ Internal Procedure)	Permanent lab (P) / Client-site (S)
Dimensional	Welding Gauges (length and angle)	(0.1 to 300) mm	20 $\mu$ m	QTS/D-WP-28:2021	P
		(0.01° to 90°)	0.2°		
	Length/ thickness/ width/ depth measurement (molds, flakiness gauges, tamping apparatus, liquid limit device, hegman gauge, etc...)	(0.1 to 1000) mm	(3 to 13) $\mu$ m	QTS/D-WP-23:2021	P / S
	Paint Coating Thickness Gauge (dry film and wet film)	23 $\mu$ m to 10 mm	(0.9 to 9) $\mu$ m	QTS/D-WP-32:2021	P / S
Vibration	Vibration Meter and Vibration Source Measurement	Acceleration ( a ) (1 to 20 ) m/ s <sup>2</sup> @ 16Hz to 1.3 kHz	1.2 %	QTS/Ph-WP-06:2021	P / S
		Velocity ( v ) (0 to 20) mm/s	1.2 %		
		Displacement ( d ) ( 0.01 to 1) mm	1.2 %		
<b>END</b>					